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ABSTRACT

A pilot study attempted to document the existence and incidence of learning disabilities (LD) among primary school children in Botswana. The study also sought to identify effective identification procedures and to determine if LD students are unique to technologically-oriented societies. Data were collected on 620 children from 4 schools (2 English-speaking and 2 Tswana-speaking schools) through various methods: (1) teacher identification of possible LD children; (2) a researcher-developed behavior rating scale; (3) the Developmental Test of Visual Motor Integration (Beery and Buktenica, 1967); (4) Short Form Test of Academic Aptitude, a derivation of the California Test of Mental Maturity (Sullivan, Clark, and Tiegs, 1970); and (5) school performance. Results of these procedures indicated that LD students do exist in Botswana primary schools, since teachers identified 8-11 percent of the sample as LD, the Behavior Rating Scale identified about 13 percent, and the integration test identified about 6 percent. Both the behavior rating scale and the integration test were most effective as screening devices for determining children who are not learning disabled. Evidence of the existence of LD children in Botswana suggests that there may be a neurological or genetic rather than strictly environmental interpretation of the origin of learning disabilities. (CB)

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LEARNING DISABILITIES AMONG PRIMARY SCHOOL CHILDREN IN BOTSWANA:

A Pilot Study

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ABSTRACT

Very little research has been conducted concerning the incidence and nature of Specific Learning Disabilities in Third World Countries. This pilot study attempts to document the existence of Specific Learning Disabilities among primary school children in Botswana and to provide some description of the incidence and characteristics of the handicap in this setting as well as to compare the relative effectiveness of techniques for identification of such children. Four sub-populations of primary school children are sampled and teacher identification procedures are compared with the results of a behaviour rating scale and a group test of visual-motor integration (VMI). Findings indicate a significant proportion of children whom teachers identify as possibly having a specific learning disability. The behaviour rating scale and the VMI predict moderately well the children whom the teachers are likely to identify, but have their greatest effectiveness at the upper ends of the scale--i.e. screening out those who are not likely to be identified as learning disabled by their teacher.

LEARNING DISABILITIES AMONG PRIMARY SCHOOL CHILDREN IN BOTSWANA:
A Pilot Study

During the past few decades educators, worldwide, have increasingly focussed on the special needs of school children with specific learning problems. These are children who are typically understood to be average or even above average in general intelligence but who, for reasons not always apparent or clearly understood, are having unusual difficulty with school learning. This increased focuss and attention has been particularly evident in the industrialized countries of the world but has also been paralleled to some extent in the third world or developing countries of the world although much more recently and on a much smaller scale.

The field of "Learning Disabilities," (a term popularized by Kirk at a conference in Chicago in 1963) continues to generate much discussion among the professionals. For those familiar with the field, the disagreement of "experts" about the nature and etiology of learning disabilities, as well as the incidence, does not need elaboration here. Suffice it to point out that estimates of the percentage of children who can be properly classified as learning disabled vary a great deal. Surveying 2400 second grade children in the U.S., Meier (1971) found that 15% were considered to be learning disabled. Using stricter criteria he concluded that about 4.7% could properly be considered learning disabled. In a review of twenty-one studies, Bryant and McGloughlin (1972) concluded that incidence ranged from a high of twenty-eight percent to a low of three percent. Kirk (1972) believes that "the best guess is that from one to three percent at the least, and

possibly seven percent at the most, of the school population recuire remedial special education." In any case, it is obvious that even if one chooses the lower, more conservative, estimates of incidence, a substantial number of school children are affected by the problem.

One of the reasons for the variation in estimates of incidence, of course, lies in the disagreement over what constitutes a learning disability and how it should be defined. Medically-oriented definitions use terms such as brain injury, minimal cerebral dysfunction, and central nervous system disorder, while more behaviorally-oriented definitions refer to perceptual handicaps, conceptual disorders, reading disabilities, language disorders or arithmetic disorders.

Some insist on considering the environment as a major causal factor. As evicence, they point to the cramatic increase in incicence of "learning disabled children" in the US during the last decades. Accoraing to information from the United States Office of Education, in 1969 120,000 children in that country were enrolled in programs for the learning disabiec. By 1975 this number had increased to 260,000 and by 1981 it had increased to 1,455,135! (Kirk & Gallagner, 1983). This phenomenal increase is highly disproportionate to any increase in school age population during the same time, and roughly paralleled major changes in the basic structure of American society and in societal expectations--particularly with regard to the educational system. This has resultec in a tremendous increase in the pressures which are placed on children for high performance and levels of success.

The fact that "learning disabilities" seem particularly prevalent among American middle class children has led to it's being called the "American Middle Class Disease" (see Cruikshank, Morse and Johns, 1980). Tarnopol and Tarnopol (1981) likewise point to the role that environment can play in learning difficulties -- particularly deprived early environments.

Others, nevertheless remain convinced of, at the very least, a contributing element of neurological or genetic disorder which in some way inhibits or interferes with the normal development of the mental operations which are required for school learning. The history of this view (that of postulating neurologically-based origins) goes back, in fact, to the previous century in Europe with the views of persons such as the German Rudolph Berlin and Kussmal who used the term Wortblindheit (word-blindness) (Tarnopol and Tarnopol, 1981). In the U.S., Orton (1925, 1928) is usually considered to be the first to discuss the possible existence of "subtle neurological differences" as an explanation for the failure of some chilcren to learn to read. Fernald (1943) and others have contributed to the ongoing debate which still continues in American educational circles.

Since the mid-seventies in the U.S., the working definition provided by the United States Congress in its Education for All Handicapped Children Act (1975) (known as P.L. 94-142) has been used widely in that country for purposes of determining eligibility for federal funds and has been sucessful in at least muting the debate to some extent. Borrowing from

definitions of the U.S. Office of Education and other groups, the congress defined the learning disabled as

> . . . those children who have a disorder in one or more of the basic psychological processes involved in understanding or in using language spoken or written, which may manifest itself in imperfect ability to listen, think, speak, read, write, spell or to do mathematical calculations. Such disorders include such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Such terms do not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, or environmental, cultural or economic disadvantagees.

It is essentially this definition which provides the working basis for this study and further serves to focus one of the questions posed, as will be noted later.

As mentioned earlier, the focus on specific learning problems of school children has been evident throughout much of the "western" world --although often they have used different terms such as dyslexia, word blindness or learning impairment, depending on the particular country. The same focus has, to a lesser extent, been paralleled in many of the developing countries of the world although there, it is generally of a much more recent origin. In a 1971 UNESCO study, for example, a significant number of African countries indicated that they had no provisions for special education whatsoever (cited in Tarnopol and Tarnopol, 1982). Since the time of that report, many aspects of the educational picture in developing countries the world over have changed in many ways. Among these changes are an increasing emphasis on the needs of the handicapped child (e.g. see Kilonzo, 1984). However, in

many of these settings the focus has tended in particular to be on more visible, gross handicaps such as physical impairment, blindness, deafness or mental retardation (e.g. Serpel, 1982a; Backman, 1983; Barr & Jonsson, 1984).

One reason for the delay in focussing on special education is the often severly limited resources and facilities for even basic education in many third world settings. However, a second reason is undoubtedly that "specific learning disabilities" as considered here are an "invisible handicap." As such they can be easily overlooked or mistaken for something else such as retarcation or "laziness." Unfortunately, even specialists in third world settings have sometimes failed to recognize Specific Learning Disabilities as something other than some degree of mental retardation (e.g. see Serpel, 1982b). The result, in any case, has been that specific learning disabilities, as defined here, have been virtually ignored in much of the third world. In fact, some would argue that it remains to be demonstrated whether the concept of specific learning disabilities, as understood in the west, has a useful role to play in third world education.

Obviously, if learning disabilities as understood in the west do not occur in third world countries, or occur only in insignificant numbers the problem does not require attention. Further, should this be the case, evidence would be accumulated for the environmental origins of the handicap. On the other hand, if there are indeed neurological factors which contribute to development of the disability, one would expect the proportions of children with specific learning disabilities to be

relatively uniform world-wide. At present, there is no reason to believe that such disabilities would observe national, ethnic or cultural lines. On a more practical note, if the proportions of learning disabled children are similar world-wide, it is apparent that a substantial number of children in third world countries have been denied school success because educators in those countries, for a variety of reasons, have lacked the necessary awareness, understanding or resources to deal with the problem.

Botswana

During the past several years a number of international consultancies and seminars focussing on the needs of handicapped children, have been held in Botswana (see Serpel, 1982a; Backman, 1983; and Barr and Jonsson, 1984). These have served to direct increasing attention and resources toward the needs of the special education population. In 1983 a special education unit was formed within the Ministry of Education and a large-scale survey of special education needs was initiated. As this survey focussed on finding those children who had obvious handicaps such as hearing or visual impairments, there was, unfortunately, no effort to identify the learning disabled child as defined in this study.

It might be further noted that as country with a very rapidly expanding primary and secondary educational system and in which there is much concern about increasing the quality of the educational program, Botswana is much concerned about the high failure rate of children in the schools, especially at the primary level. Thus, it seems of both

practical and theoretical interest to explore the concept of learning disabilities in this context.

Research Questions

This study seeks answers to three fundamental questions about learning disabilities in the primary school children of Botswana. These questions are: (1) Are there children in Botswana's primary schools who can be tentatively identified as possibly learning disabled? (2) If so, what is their proportion to the total primary school population? and (3) What techniques or methods appear to effectively discriminate them from the rest of the population? Also of interest is the more general question of the cultural or societal specificity of specific learning disabilities. That is, are there reasons to believe that western technologically-oriented societies are unique in producing large numbers of children with specific learning disabilities or is the problem one that is shared with the less technologically developed third world countries?

Most of Botswana's primary school children attend schools in which the medium of instruction for the first four years is in the Tswana language, changing to English (the official language of the country) only at the beginning of standard 5. A much smaller percentage (including many of the children of expatriates) attend English Medium schools in which English is the medium of instruction from the very beginning. While the populations of these schools differ from each other in several important dimensions (for example, many of the children in

the English Medium schools are native speakers of English whereas for almost all of the others it is a second language) it seems worthwhile to ask whether the proportion of possibly learning disabled children differs between the two kinds of schools. It further seems of interest to compare the relative effectiveness of identification procedures for each population.

METHOD

Sample

Four primary schools were randomly selected from within the city of Gaborone and data collected from all of the standard five and standard seven classes in each school. Two of the schools were Tswana Medium and two of them were English Medium. Data were collected on a total of 620 children. Of the standard seven students, 148 and 151 were in the Tswana and English Medium schools respectively, while 159 and 162 were standard five students in the Tswana and English Medium schools respectively.

Data

The following data were collected from each of the sample classes, with the single exception that teachers in the English Medium standard fives did not participate in the "Teacher Indentification" exercise.

1. Teacher Identification of Possibly Learning Disabled Children.

The logical place to begin answering the question of whether or not there are learning disabled children in Botswana's primary school classrooms was with the teachers. Teachers of the sample classes were

supplied with a brief orientation to the concept of specific learning disabilities and provided with a compiled list from the literature of "typical" behavioral characteristics of learning disabled children. They were then instructed to identify by name any children from their classes who consistently demonstrated at least ten or more of the behavioral characteristics on the list. The teachers lists of children were then collected from the head teacher of each school about two weeks later.

To avoid possible contamination of any of the data to be collected later, the teachers who completed this exercise were those who had taught the children during the previous year (i.e. the teacher who taught the standard 5's when they were still in standard 4). This exercise was completed early in the academic year when it was assumed that the memory of the previous year's class was still relatively vivid.

2. Behavior Rating Scale.

Typically, students who are learning disabled exhibit characteristic behavioural symptoms to a greater or lesser degree. A scale of student behavior based on the literature was developed and adapted by the senior author and the current year teachers were asked to rate each of the children in their classes on a 5 point Likert-type scale in which a 3 represented "average" while a 1 and a 5 were "low" and "high" respectively. The items on the scale were grouped into six subscales representing six dimensions of student behaviors or skills: receptive language, verbal expression, spatial orientation, behavior, motor co-ordination, and academic skills. A score was calculated for each of

the six subscales as well as a total score for each student. The subscales were made up of 3 to 8 individual items.

3. Test of visual-motor integration.

As noted earlier, the question of the relationship between visual-motor integration and specific learning disabilities remains a somewhat controversial one in spite of intensive research over the years (see Kephart, 1960, Frostig et al, 1964, Beery, 1982). The Developmental Test of Visual Motor Integration (Beery and Buktenica, 1967) was adapted by permission of the publisher and administered by the researchers to each of the classes in the sample. The "VMI" is a group--or individually--administered paper and pencil test of visual-motor integration with reported scoring reliabilities averaging .93 and a median test-retest reliability of .81. The author notes (Beery, 1982) that predictive validity of the instrument tends to decrease as children become older. The author reports that studies have shown minimal cultural bias in the instrument which consists entirely of reproducing geometric forms of increasing complexity.

4. Test of academic aptitude.

The attempt to provide some control for academic ability was complicated by the fact that there are no existing group-administered tests of this nature which have been normed in, or developed for use in, Botswana. The Short Form Test of Academic Aptitude, a derivation of the California

Test of Mental Maturity, (Sullivan, Clark and Tiegs, 1970) was adapted (again by permission of the publisher) and used for this purpose. Reliability and validity data as reported in the manuals appear to be adequate for use as a screening instrument, however, standardization and development of the "SFTAA" is based on American norms--wherein lies it's major weakness for use in Botswana. Thus the adaptation for administration in Botswana which consisted primarily of changing some of the pictoral stimuli and re-wording and expanding some of the instructions to the students. The test is composed of four subtests: (English) vocabulary, analogies, sequences and verbal memory. Each of the subtests are combined with one of the others to yield a verbal and a non-verbal score.

Since appropriate norms do not exist for any of these instruments in Botswana, all of the scores obtained were used only as raw scores or as standardized scores based on the group standard deviations and means.

5. School performance.

Student marks or grades were also obtained for each of the classes. However, the lack of uniformity in marking practices across the schools made comparison across classes or schools impossible.

RESULTS

1. Are there learning disabled children in Botswana primary schools? If so, what is there proportion to the rest of the population?

These questions were addressed in two ways: firstly by calculation of a simple percentage of the children identified by the teachers as possibly LD compared to the total group of children within that school type and standard, secondly by examination of the percentage of children falling at least two standard deviations below their group means on the Behavior Rating Subscales and the VMI. Results of these analyses are shown in Tables I and II. The proportion of males and females in the groups identified by the teachers is shown in Table Ia.

TABLE I

Overall Percentage of Students in Each School Who Were Indentified by Teachers as LD

Tswana Medium Schools		English Medium Schools	
Standard 5	Standard 7	Standard 5	Standard 7
11%	8%	N/A	12%

TABLE Ia

Proportions of Males and Females in Teacher-indentified Groups

	Tswana Medium Schools		English Medium Schools	
	Standard 5	Standard 7	Standard 5	Standard 7
Males	47%	58%	NA	59%
Females	53%	42%	NA	41%

As can be seen from Table I the overall percentage of children identified in each of the schools by the teacners, ranged from eight percent to twelve percent. These percentages are all higher than even the highest estimates of Kirk (1972) and well within the range of Meier's (1971) more generous estimate.

Table Ia indicates the proportions of males and females in the indentified groups. As indicated, both the Tswana Medium and English Medium standard sevens identified similar proportions of males and females, with males representing the slightly larger proportion. This pattern was reversed in the Tswana standard fives where slightly more females were identified than males.

TABLE II

Percentage of Children Falling at Least Two Standard Deviations Below the Mean on the BRS Subscales and the VMI.

		BRS1	BRS2	BRS3	BRS4	BRS5	BRS6	BRST	VMI
Tswana Medium Schools	Std. 5 N=156	12%	13%	6%	6%	0.1%	11%	6%	6%
	Std. 7 N=140	6%	7%	0.1%	0.1%	0	0.1%	0.1%	5%
English Medium Schools	Std. 5 N=141	2%	2%	0.1%	0.1%	0.1%	0.1%	0	0.1%
	Std. 7 N=145	0	0	0	0	0	3%	0	3%

Key for BRS Subscales

BRS 1: Receptive Language
BRS 2: Verbal Expression
BRS 3: Spatial Orientation
BRS 4: Behavior
BRS 5: Motor Co-ordination
BRS 6: Academic Skills
BRS T: Total of BRS

Table II presents a somewhat more varied picture. The percentages of children falling at least two standard deviations below their group mean on the BRS Subscales and the VMI range from a low of 0 on several of the BRS Subscales for the English Medium standard sevens to a high of 13% on BRS 2 (Verbal Expression) for the Tswana Medium standard fives. In general it would appear that far higher percentages of children from the Tswana Medium schools score low on these instruments than do those from the Engligh Medium schools. This is particularly interesting when one notes that all of the scores are derived from their own distributions,

that is, they are based on their own (i.e school type and standard) group means and standard deviations, thus providing some control for the possible tendency of teachers in a given school to uniformly rate children high or low. The extent to which each of the reported percentages deviates from the percentage of cases expected in that portion of a normal distribution (approximately two percent of a normally distributed population falls lower than two standard deviations below the mean) provides an indication of the extent to which particular distributions are skewed. By way of example, from Table II it can be seen that in the English Medium schools very few or no children fell two or more standard deviations below the mean--thus indicating a positive skew in the distributions. In other words fewer of these children scored far below the mean of the distribution than expected. The "spread" of scores then, was most pronounced above the mean, while, below the mean, scores did not vary as much. For the Tswana Medium standard fives the situation is nearly reversed--more often than not, larger-than-expected percentages of children fell below the second standard deviation, thus indicating a negative skew. For the Tswana Medium standard sevens, the picture lies somewhere between the two extremes. Negative skews were evident in the BRS1 and BRS2 and in the VMI.

To summarize, it appears that for almost all groups there is tendency for the distributions on the Motor Co-ordination Scale (BRS5) to be positively skewed--i.e. few obtained low ratings. However, in both standards five and seven of the Tswana Medium schools, substantial numbers of children scored low in both language related areas--Receptive

Language and Verbal Expression, although even then the percentage of standard fives scoring very low in these areas was about twice that of the standard sevens. A relatively large number of Tswana Medium fives were rated low on Academic Skills. This phenomenon did not seem to occur in the other classes. Compared to the children in the English Medium schools, the children in the Tswana Medium Schools seem to experience greater difficulty with the VMI--almost three times as many children as would have been expected, scored very low (i.e. five and six percent found in this study versus about two percent which would be expected in a normal distribution).

2. What techniques or instruments can best identify these children?

A major problem with the present study lies in the fact that there are no accepted criteria or benchmarks for more positive indentification of learning disabled children within the Botswana context. This means that measurements used here could only be compared among themselves and were thus of necessity exploratory and essentially correlational in nature. In essence, the question addressed in this part of the study could be re-phrased as: Of the measures used, which, if any, seem to identify the same children as being "at risk" and what is the extent or strength of agreement between these measures?

Four approaches were used to address this question: a) Comparisons of BRS and VMI means and standard deviations obtained by the children in the LD group (as identified by their teachers) with those not in the LD

group, and comparisons of proportions of children from the LD groups and the non-identified groups who scored significantly below the means on the BRS Subscales and the VMI; b) Correlational analyses of the relationships among the various BRS Subscales and the VMI; c) Cross-tabular analyses of the relationship between scores on BRS Subscales, the VMI and teacher identification as LD; and d) Discriminant Analysis using teacher-identification as LD as the independent variable and the BRS Subscales and the VMI as the discriminating variables. In other words, using teacher-identification as LD as the criterion, how well can the BRS Subscales and the VMI together predict membership in the that group?

a. The comparison of means and standard deviations between the groups on BRS Subscales, the VMI and the SFTAA is shown in Tables IIIa and IIIb.

TABLE IIIa

BRS, VMI and SFTAA Means and Standard Deviations for Children from Teacher-Identified-LD Groups and Non-Identified Groups

	Tswana Medium St. 5				Tswana Medium St. 7				English Medium St.5				English Medium St.7			
	LD		Non-ID		LD		Non-ID		LD		Non-ID		LD		Non-ID	
	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
BRS1	21.9**	6.2	27.6	10.4	23.5	8.3	29.9	10.9	NA	NA	NA	NA	26.5***	5.2	32.5	9.6
BRS 2	21.4***	4.5	26.6	10.2	22.9*	7.2	29.0	10.5	NA	NA	NA	NA	28.4*	6.7	32.2	8.9
BRS 3	28.5	2.8	29.1	9.5	30.6	6.3	34.5	8.9	NA	NA	NA	NA	30.1**	3.8	33.9	8.1
BRS 4	21.1*	5.0	29.6	10.1	28.9	6.0	33.3	8.5	NA	NA	NA	NA	27.6**	5.7	33.2	8.4
BRS 5	30.2***	0.8	32.6	8.2	33.9	7.2	35.2	8.2	NA	NA	NA	NA	28.6*	5.1	32.2	7.3
BRS 6	24.5**	6.2	29.5	11.5	29.3	6.0	34.2	9.1	NA	NA	NA	NA	28.3**	5.8	34.8	9.4
BRS TOT	25.5**	4.1	29.1	9.5	28.0**	5.0	32.7	8.5	NA	NA	NA	NA	28.1***	3.9	33.3	8
VMI	16.9*	2.7	18.1	2.7	18.8	2.7	18.8	2.4	NA	NA	NA	NA	18.6***	1.9	20.7	1.9

TABLE IIIb

SFTAA Means and Standard Deviations for Children From Teacher-Identified-LD Groups and Non-Identified Groups

	Tswana Medium St. 5				Tswana Medium St. 7				English Medium St.5				English Medium St.7			
	LD		Non-ID		LD		Non-ID		LD		Non-ID		LD		Non-ID	
SFT 1	9.8	3.9	10.0	3.5	10.7	4.8	10.8	3.7	NA	NA	NA	NA	20.8	2.9	21.9	2.7
SFT 2	9.6	4.3	10.9	4.2	8.9*	5.6	12.5	5.1	NA	NA	NA	NA	18.3	1.5	18.6	1.3
SFT 3	10.1*	4.7	13.0	4.6	16.8	2.9	17.7	2.7	NA	NA	NA	NA	18.4**	2.5	19.4	1.1
SFT 4	7.9	2.8	9.0	3.7	7.9	4.8	9.0	4.4	NA	NA	NA	NA	18.2	1.1	18.7	1.9
SFT TOT	37.4	11.8	43.0	11.5	44.3	12.5	50.1	11.5	NA	NA	NA	NA	75.7	5.1	78.6	4.9

* (.05 significance
** (.01 significance
*** (.001 significance

ID = Children identified by teachers as LD
Non-ID = Children not identified by teachers as LD

Key For SFTAA Subtests

SFT 1: Vocbulary
SFT 2: Pictoral Analogies
SFT 3: Sequences
SFT 4: Verbal Memory
SFT TOT: Total SFTAA Score

Because of the fundamental difference in their nature, the BRS and VMI scores are considered separately from the SFTAA. As can be seen in Table IIIa there were consistent differences between the mean scores of the Teacher Identified group and the non-identified group on the BRS Subscales and the VMI. With only one exception the Teacher Identified group scored lower than their non-identified counterparts. For the English Medium standard seven students the differences were in all cases statistically significant--all but two at less than .01. For the Tswana Medium fives the differences tended to be

statistically somewhat less robust (the differences on BRS 3 failed to reach significance at all) but were nevertheless consistent in direction of the difference. The directional differences continue, for the most part, to be evident in the Tswana Medium sevens as well (the one exception being the VMI) but reach significance in only two of the eight pairs of scores.

Comparison of standard deviations on the BRS and VMI scores show considerable overlap of the distributions of the LD-identified group with the non-identified group. Thus while there is usually a clear difference in the means of the two groups there is not a clear differentiation between them in the middle ranges of the scores--that is, a student scoring in the middle ranges might well have been classified in either group.

The picture of differences becomes different when one examines the SFTAA scores in Table IIIb. While there was one exception in each group (Sequences for Tswana fives and English sevens and Non-verbal analogies for Tswana sevens) the general pattern seems to show that the two groups did not differ significantly on those dimensions that were measured by the SFTAA--although there is a consistent non-significant difference in favor of the non-identified group. The finding of non-significant differences in academic ability between Learning Disabled children and non-Learning Disabled is of course, what would have been predicted from the definition of specific learning disabilities utilized by this study.

Another approach to this question is shown in Table IV in which a comparison is made between the percentages of children scoring at least one standard

ceviation below the mean in the Teacher Identified LD group and in the Non-identifiec group

TABLE IV

Comparison of Percentages of Teacher Identified and Non-Identified Children Scoring at Least One Standard Deviation Below the Mean on the BRS Subscales and the VMI.

		BRS 1		BRS 2		BRS 3		BRS 4		BRS 5		BRS 6		BRS T		VMI	
		ID	NID	ID	NID	ID	NID	ID	NID	ID	NID	ID	NID	ID	NID	ID	NID
Tswana Medium Schools	Std. 5	70%	31%	76%	38%	17%	21%	11%	25%	0	4%	41%	24%	47%	25%	35%	9%
	Std. 7	58%	33%	59%	38%	17%	10%	33%	13%	8%	3%	33%	12%	25%	12%	20%	17%
English Medium Schools	Std. 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Std. 7	35%	16%	27%	15%	12%	2%	41%	6%	24%	2%	35%	6%	24%	4%	19%	2%

ID = Children identified by teachers as LD
Non-ID = Children not identified by teachers as LD

As can be seen from the Table IV, with only three exceptions in the entire matrix (BRS3, BRS4 and BRS5 for Tswana 5's), larger percentages from the group of Teacher Identified group scored at least one standard deviation below the mean than did those from the non-identified group. The most striking of these comparisons is in the Tswana Medium schools where for both standards five and seven between one half and two thirds of the children in the Teacher Identified group scored lower than one standard deviation below the mean on the BRS1 and BRS2 (receptive language and verbal expression respectively) while in the non-identified group one third or less scored that low. In the English Medium sevens fewer children from the Teacher-Identified group were as much as one standard deviation below the mean on any of the scales although the directions remained consistently in favor of the non-identified children.

In each case, however, there remains a substantial number of children from both groups whose scores overlap in the center of the distributions.

b. Correlations among the BRS Subscales and the VMI.

Correlations among the BRS Subscales and VMI are shown in Table V. In order to save space only the correlation matrix for the combined schools and standards is shown. While there were some differences between the correlation matrices between the types of schools and between the standards, these differences did not appear to be substantial. The overall pattern remained approximately the same for each group.

TABLE V

Correlation Matrix of the BRS Subscales and VMI

	BRS 1	BRS 2	BRS 3	BRS 4	BRS 5	BRS 6	BRS T	VMI
BRS1	1.00	.91	.79	.83	.50	.81	.92	.38
BRS 2	.91	1.00	.78	.79	.48	.80	.91	.38
BRS 3	.79	.78	1.00	.85	.58	.80	.90	.30
BRS 4	.84	.79	.85	1.00	.58	.81	.93	.32
BRS 5	.50	.48	.58	.58	1.00	.50	.63	.17
BRS 6	.81	.80	.80	.81	.50	1.00	.92	.36
BRS TOT	.92	.91	.89	.94	.62	.92	1.00	.37
VMI	.38	.37	.29	.32	.17	.35	.37	1.00

Note: <u>All</u> correlations in the matrix are significant at (.001

Inspection of Table V reveals that there is a strong inter-correlation of the BRS Subscales and, while not as strong, a nevertheless significant correlation between the VMI and each of the BRS Subscales. The high correlations between most of the BRS Subscales indicate that to a large extent the subscales are overlapping--that is to say, they appear to be tapping much the same underlying dimension(s). The scale that appears most different is the BRS 5--Motor Co-ordination. Given the nature of this Subscale such a finding would not be unexpected.

The relatively lower correlations which were found between the VMI and the BRS Subscales indicates that the VMI may be tapping a different dimension than that of the BRS scales. It is interesting to note that the strongest correlations of the VMI appear to be with the academic and language-related Subscales (BRS 1, BRS 2 and BRS 6) while the lowest is with Motor Co-ordination. One may of course suspect that lack of reliability in teacher estimation of Motor co-ordination (i.e. BRS 5) may have contributed substantially to the apparent lack of relationship between the two measures.

c. Crosstabulations of the BRS Subscales, the VMI and teacher-identification as LD.

Crosstabulations of the BRS Subscales, the VMI and identification by the teacher as LD, were conducted for each of the possible comparisons and for each of the school types and standards. Space does not permit inclusion of each of those crosstabulations in this report. However, Table VI represents a summary the most important of these--the crosstabulations of each of the Subscales and the VMI with teacher identification as LD. More specifically, Table VI shows the relationship between scoring relatively low or high on any of the BRS Subscales or the VMI ($\pm$ 1 standard deviation) and being classified by the teacher as LD.

TABLE VI

Percentage of Teacher Identified Children Scoring at least ±1 Standard Deviation Above or Below the Mean

	Tswana 5		Tswana 7		English 5		English 7	
	-1	+1	-1	+1	-1	+1	-1	+1
BRS1	34%	0%	14%	3%	NA	NA	22%	2%
BRS 2	30%	0%	12%	0%	NA	NA	27%	7%
BRS 3	9%	0%	13%	0%	NA	NA	50%	2%
BRS 4	14%	0%	19%	2%	NA	NA	50%	4%
BRS 5	0%	0%	20%	8%	NA	NA	57%	6%
BRS 6	18%	7%	20%	2%	NA	NA	46%	3%
BRS TOT	25%	0%	17%	3%	NA	NA	44%	2%
VMI	33%	7%	1%	15%	NA	NA	60%*	0%

Note: * Based on those falling 2 standard deviations below the mean

Inspection of Table VI reveals that almost without exception students scoring as much as 1 standard deviation below the mean of the Subscales and the VMI stand a much greater liklihood of having been designated as LD by their teacher. In the Tswana Medium standard fives for example, only on the BRS 6 and on the VMI did even one of the children identified by their teacher as LD score as high as 1 standard deviation above the mean. The Tswana standard sevens for the most part show the same tendency but with the VMI reversing the direction--i.e. 15% of the children from the Teacher Identified group scored at least one standard

deviation above the mean while only 1% scored as much as one standard deviation below the mean.

It is interesting to note that the two Subscales which showed the greatest differentiation for the Tswana Medium fives--BRS 1 and 2--were the same ones which showed the least differentiation for the English Medium sevens. Conversely, for this group, the BRS Subscales 3-6 showed in general a higher level of differentiation than did the first two. Particularly noteable here (using ± two standard deviations as the cut-off since the effect is illustrated more clearly) is the VMI which in this case shows that of those scoring at that level below the mean, sixty percent were in the teacher-identified group while for those the same distance above the mean none were members of that group.

Aside from the between-group differences noted, it should be further emphasized that interpretation of these scores must be highly tentative since the actual number of children included in the teacher-identified groups are small. Sometimes a shift of only a few children from one cell into another could have a fairly substantial impact on the resulting percentages. It is also of course noted that the relatively larger numbers of children from both groups who fall into the middle ranges of their distribution are not accounted for in Table VI. For these children--those falling in the middle of the distributions--both the BRS Subscales and the VMI failed to discriminate between the groups.

d. Discriminant Analysis

Using membership in the teacher-identified group as the criterion, the BRS Subscales, BRS Total Score and the VMI were weighted by means of a discriminant analysis procedure and the resulting combination of weights used in attempting to predict membership in the teacher-identified group. The results of this analysis and prediction are shown in Table VII.

TABLE VII

Accuracy of Classification into Teacher-identified And Non-identified Groups Using BRS Subscales and VMI Using a Discriminant Analysis Procedure

	PREDICTED L. D.							
TEACHER IDENTIFIED	Tswana St. 5		Tswana St. 7		English St. 5		English St. 7	
	Yes	NO	Yes	NO	Yes	NO	Yes	NO
Yes	70.6% (12)	29.4% (5)	60.0% (6)	40.0% (4)	NA	NA	87.5% (14)	12.5% (2)
No	21.5% (29)	78.5% (106)	36.2% (47)	63.8% (83)	NA	NA	22.2% (28)	77.8% (98)
Over-all percentage classified correctly		77.63%		63.57%				78.87%

Inspection of the table reveals overall percentanges of correct classification ranging from almost sixty-four percent to almost seventy-nine percent. Obviously a majority of children overall were classified correctly as either belonging or not belonging to the group of Teacher Identified children. Closer examination of each of the 2 x 2 classifications, however, shows that the relatively high overall

percentage of correct classifications was the result of the accuracy of the predictions for non-membership. Of those who were predicted to be members of the LD group, the predictions were far more often wrong than right. Thus, it would appear that the combined BRS Subscales and the VMI are relatively effective in predicting which children would not be in the teacher-identified group--i.e. eliminating those who would not be identified as LD--but are of little value in predicting those who would be. Stated in another way, the problem of false negatives (for LD group membership) is minor--even negligible--but the problem of false positives is major. Many more children would likely be identified than actually belonged in the group. The implications of this finding for identifying LD children in Botswana will be further discussed in a later section of this paper. In any case, it should also be pointed out that the validity of this procedure is totally contingent upon the validity of the criterion, i.e. the validity and accuracy of the teacher identifications. Lacking any external criteria by which to judge the effectiveness of the teacher judgements, we can only point to the strength (or lack of it) of the relationships between the instruments of this study.

DISCUSSION AND CONCLUSIONS

Are there children in Botswana's primary schools who can be identified as learning disabled?

The answer to this question provided by the data seems to be at least a qualified "yes." Although the results cannot be considered conclusive, since no acceptable procedures for actual identification of learning disabilities were used--by either of the several measures used in the study, there seems fairly strong agreement that learning disabled children do exist in Botswana's primary schools. The fact that teachers identified from eight to eleven percent of their children as possibly learning disabled and that up to thirteen percent scored as low as two standard deviations below the mean on one or more of the BRS Subscales (a rating of behavior as perceived by the teacher) at the least indicates that there are substantial numbers of children in Botswana's primary school classrooms whose specific learning problems are of concern to their teachers. Furthermore, if the VMI provides a measure of skills that are important to school achievement, it would appear that up to six percent (not necessarily the same ones identified otherwise) have unusual difficulties which may have reason to cause concern. Whether or not the children identified here would actually meet the more stringent criteria for learning disability provided by an individual evaluation is, of course, not known at this time.

What is the proportion of children identified as possibly learning disabled to the total primary school population? How do the proportions differ between the Tswana Medium schools and the English Medium schools?

As has already been pointed out, the answer to this question seems to vary depending on the school type, class, selection procedures and

criteria used. Based on selection by the teacher alone, it would appear that the proportions indicated (eight to twelve percent) are in fact higher than would have been predicted by researchers in the U.S. (e.g. Kirk, 1972). Even if one assumes that teachers may have overestimated by as much as fifty percent, one is still left with a substantial percentage of children remaining.

Using the BRS or the VMI as criteria the results are more varied. On the face at least it would seem that a larger number of Tswana Medium school children (especially in standard five) are rated very low by their teachers than in the English Medium schools. This may in fact be the case. However, it should be pointed out that other factors may be involved. For example, while calculating means for each group separately provided some compensation for teacher response bias, this could not be entirely eliminated and the inconsistent results accross school types and standards may in part be attributable to that factor. It is possible that teachers of the English Medium standard sevens in particular were reluctant to rate their children low on the BRS scales since they may consider that children who have "survived the system" long enough to reach that level must be at least average--if not above. Alternately, it may be that in the English Medium schools, children with serious learning difficulties have in fact actually left the school prior to reaching that level.

There is also the possible error factor inherant in the teacher herself--i.e. not clearly understanding distinctions between points on the rating scale or, in some cases, not knowing the children well enough

to make clear distinctions between points on the scale. Both of these may well lead to a tendency to rate the child neither high nor low--i.e. average.

There seems to be an indication that in the Tswana Medium schools both Receptive Language and Verbal Expression are areas in which many children have difficulty. It is not clear however, whether the teachers were responding on the basis of the children's having difficulty with English (which in most cases would be a second language for these children) or with language more generally defined. In the former case, of course, a child who happens not to be fluent in a second language is not necessarily one is learning disabled. To the extent that the teachers may have confused these issues, the reliability of the proportions presented is of course suspect. In any case there seems to be little substantial reason to believe that the proportion of children overall who may be learning disabled is significantly less than that which would be found in settings such as the US.

What techniques or methods appear to effectively discriminate learning disabled children from others?

This question is a complex one and, particularly in the absence of an external criteria, cannot be answered conclusively. However, several observations can be made:

a. With the exception, at most, of the Motor Co-ordination Scale, it would appear that the BAS Subscales are generally measuring many of the same characteristics. This raises questions of the extent to which the

different Subscales are tapping different dimensions or whether they might in fact represent a more global evaluation by the teacher of the student which is generalized accross the scales. In actual practice the intercorrelation of the Subscales means that one might use any one of them (particularly the Verbal Expression and Receptive Language) with very little loss in discrimination.

b. The VMI seems to be tapping something other than the dimension(s) being tapped by the BRS and, to some extent, something different than whatever it is that determines who the teachers will identify as learning disabled. This does not necessarily lead to the conclusion, however, that the VMI has nothing to contribute to the identification process. Only further research can answer that question, however, it is conceivable that the VMI is tapping a dimension which while important, may not be easily observed by the teacher.

c. Taken as a <u>group</u> it is clear that both the VMI and the BRS Subscales differentiate between those whom the teacher identified as learning disabled and those not so identified. This difference was consistent and fairly robust accross the school types and standards as evidenced in the significance levels obtained on the T-test for differences between the means.

The finding of significant group differences is not the same however, as finding <u>practically</u> significant individual differences. Both the BRS and the VMI differentiated most clearly between those in the teacher-identified group and those not in the group at the <u>upper</u> end of

their scales. That is to say, few if any of ne children whom tne teacners identified as learning disabled scored nigh on any of tne BRS Subscales or tne VMI. However, in tne middle and lower ranges of botn instruments tnere was substantial overlap. So tnat wnile one could be fairly certain that cnild wno scored nigh was not likely to be a member of tne LD group, one could not make an accurate prediction about tnose who may nave scored in tne middle or lower parts of tne distributions. Tne practical effect of tnis is tnat, at tne present level of refinement, tne instruments appear to have usefulness among Botswana's primary school children as screening devices but furtner evaluation is obviously required for identification.

d. Tne failure to find significant differences between tne groups on most of tne SFTAA scores provices evidence in support of tne children which were identified by tne teacners having been cnosen for reasons other than lack of general academic ability. Tne correlations between tne SFTAA scales and tne BRS and VMI were likewise found to be relatively low. These findings are consistent with tne definition of Specific Learning Disabilities used nere and lend some validity to tne identifications which tne teacners made as well as supporting tne conclusion tnat both tne BRS and tne VMI are tapping dimensions otner than academic ability. However, since tne SFTAA has not yet been subjected to validation studies in Botswana witn tne Botswana adaptations of tne scale, conclusions must be tentative.

Finally, what evicence, if any has been accumulated with regard to the relationship between environment and the occurance of specific learning disabilities in primary school children?

It is obvious, of course, that studies such as this one cannot be used as conclusive evicence in this ongoing debate. However, finding children in this setting--a distinctly non-technologically oriented one--who show evicence of specific learning disabilities lends weight to a non-environmental interpretation of the handicap's origin. It is interesting to note, however, that in the English Medium standard sevens the percentage of children whom the teachers identified as possibly learning disabled was fifty percent higher than in the Tswana Medium standard sevens. As pointed out earlier, the English Medium schools contain a relatively high number of children from expatriate families (particularly British, Scandanavian and American), thus one would find some similarity between these children, as a group, and children in the more technologically developed parts of the world. In this case, the relatively higher level of incidence in the English Medium schools may indicate at least a cultural or societal contribution to the handicap. Conversely, it may be that the greater awarness of the teachers in the English Medium schools (most of whom recieved their training in the "west") of the concept of specific learning disabilities may have contributed to their "finding" more of these children. If one chooses to use low scores on either the BRS Subscales or the VMI as the indicator of the number of children who might be learning disabled, the situation is, of course, reversed. Once again one cannot be certain

whether differences in the teachers' training and orientation (since they actually performed the rating in the case of the BRS) may not account for some of the observed differences between school types.

The finding of a higher number of males over-all in the Teacher Identified groups compared to females is consistent with that reported by Tarnopol and Tarnopol (1982) although the ratio found is not nearly so high--the Tarnopols report the ratio of boys to girls to be almost universally between three to one and four to one. This consistent preponderance of boys to girls with specific reading or learning problems is cited in the aforementioned report as evidence of a "genetic basis for the problem (p.3)". The evidence from this study is hardly conclusive in this regard although it is suggestive.

SUMMARY

This study investigated the existence and frequency of specific learning disabilities among four sub-populations of primary school children in Botswana and the effectiveness of various procedures for identification of specific learning disabilities among these children. Of related interest were questions pertaining to the cultural or societal specificity of learning disabilities and, by implication, questions about the origin of specific learning disabilities among school children.

Although not conclusive because of the lack of external criteria for diagnosis, there seems to be strong evidence for the existence of specific learning disabilities among Botswana's primary school children.

This finding provides evicence in favor of a neurological or possibly genetic rather than strictly an environmental interpretation of the origins of specific learning disabilities.

With regard to incentification procedures the Benaviour Rating Scale and the VMI were both seen to nave potential usefulness in the icentification process--primarily as screening devices since their major effectiveness seems to lie in their ability to eliminate those who were not learning disabled. In each case, however, many false positives were found (for LD) hence the need for further assessment of these children for positive icentification.

It is recommended that further studies be conducted which are broader and more representative of Botswana's total population and that in such studies particular attention should be paid to the following:

- Verification of the proportions of children with specific learning accross various subpopulations within Botswana, paying particular attention to environmental factors which may be related to occurance of the handicap.
- Provision for in-depth assessment of a sample of children included in the study in order to provide an external criterion for jucging the effectiveness of identification procedures.
- Younger children should be used in the sample to determine the effectiveness of either or both of the instruments for identification of children with potential proolems early in their school career.

REFERENCES

Babcock, S. "Botswana: Existing and Planned Educational Services for the Handicapped." Unpublished paper written for the Botswana Council for the Disabled, Gaborone, 1983.

Backman, C. Special Education in Botswana: Hints and directions for a policy on the education of handicapped children. Unpublished paper prepared for the Ministry of Education, Botswana, under auspices of the Swedish International Development Authority, 1983.

Barr, J. H., & Jonsson, T. Special Education. Report prepared for the Government of the Republic of Botswana by the United Nations Educational, Scientific and Cultural Organization. FMR/ED/SCM/84/132, 1984.

Beery, K., Administration, Scoring and Teaching Manual for the Developmental Test of Visual Motor Integration. Cleveland:Modern Curriculum Press, 1982.

Beery, K.E. and Buktenica, N., Developmental Test of Visual Motor Integration. Cleveland:Modern Curriculum Press, 1967.

Bryant, N. D. and McLoughlin, J. A. "Subject Variables: Definition, incidence, characteristics, and correlates." In N. D. Bryant and C. E. Kass, (Eds.), Final report: Leadership training institute in learning disabilities (Vol. I). Tucson: University of Arizona Department of Special Education, 1972.

Cruikshank, W., Morse, C. and Johns, J. Learning Disabilities: The Struggle from Adolescence to Adulthood. New York: Syracuse University Press, 1980.

Education For All The Children Act. Public Law 94-142 Ninety-Fourth Congress of the United States of America. November 29, 1975.

Fernald, G. M., Remedial Techniques in Basic School Subjects. New York: McGraw-Hill, 1943

Frostig, M., Lefever, D., and Whittlesey, J. The Marianne Frostig Developmental Test of Visual Perception. Palo Alto:Consulting Psychologists Press, 1964.

Kephart, N.C. The Slow Learner in the Classroom. Columbus: Merrill, 1960.

Kilonzo, F.M. "Current Services for Special Education in Eastern Africa--A Report," BERC Bulletin, No. 8. Kenyatta University College, Nairobi.

Kirk, S. A. "Behavioral Diagnosis and Remediation of Learning Disabilities." Proceedings of the Annual Meeting of the Conference on Exploration into the Problems of the Perceptually Handicapped Child. (Vol. I). Chicago: Perceptually Handicapped Children Inc., 1963.

Kirk, S. A., & Gallagher, J. J. Educating Exceptional Children. Dallas: Houghton Mifflin, 1983.

Meier, J. "Prevalence and characteristics of learning disabilities found in second grade children." Journal of Learning Disabilities, 1971, 4, (January) 6-19.

Orton, S.T. "Word Blindness in Children," Archives of Neurology and Psychiatry, 14:581-615, 1925.

Orton, S. T. "Specific Learning Disabilities--Strephosymbolia," Journal of the American Medical Association. 90:1095-1099, 1928.

Primary Education Survey 1982. Examinations Unit, Curriculum Development and Evaluation, Republic of Botswana, 1983.

Serpell, R. "Childhood Disability in Botswana", A Report prepared for UNICEF and the Government of Botswana, 1982a.

Serpell, R. "Planning and Delivery of Community Based Services for Mentally Handicapped Children in Africa," A paper presented at the 8th World Congress of the International League of Societies for Persons with Mental Handicap. Nairobi, 1982b.

Sullivan, E., Clark, W. and Tiegs, E. Short Form Test of Academic Aptitude. Monterey, CA:CTB/McGraw Hill, 1970.

Tarnopol, L. and Tarnopol M. Comparative Reading and Learning Difficulties. Lexington, MA: Lexington Books, 1981.

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